Mississinewa Reservoir

2008 Fish Management Report

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EXECUTIVE SUMMARY

- In 1997 computer modeling indicated that a ten foot increase in winter pool in combination with a slower drawdown would not have a major impact on flood storage capacity, and the ACE agreed to a three year trial period to verify the model. The trial would increase winter pool from 712 to 722 ft MSL, and have the potential to improve the fish community.

- General fisheries surveys were completed from 1997 through 1999 until the project was halted in the fall of 1999. At that time the ACE announced there was a problem affecting the integrity of the dam. The reservoir was lowered to winter pool by October of that year and remained at that level until the repairs were complete in the spring of 2005. Following the repairs to the dam the trial has continued and winter pool has remained 10 ft higher than normal. General fisheries surveys were completed again in 2006 and 2008.

- A total of 2,368 fish, weighing 1144.54 lbs was collected during this survey. Bluegill was the most abundant species collected by number (22%), followed by gizzard shad (19%), and quillback (10%). Quillback was the most abundant species collected by weight (24%), followed by channel catfish (20%), and common carp (9%).

- The six year dam repair project that was completed in 2005 has severely confounded the results of the original research project to measure impacts on the fish community as a result of increasing winter pool at Mississinewa Reservoir.

- Excluding catch rates observed in 2006, catch rates of both bass and bluegill during 1999 and 2008 are slightly elevated when compared to previous surveys conducted prior to increasing winter pool. However, these increases are minimal and could be the result of sampling variation.

- Changes in abundance of other game species including white crappie, white bass, channel catfish, and walleye were minimal.

- Although no dramatic increases have been documented as a result of this project a reduction in fish mortality and an increase in invertebrates as a result of increasing winter pools have been documented at other flood control reservoirs (Benson and Hudson 1975, Ramsey and Pierce 1978, Smith and Anderson 1984).

- Despite our best efforts to measure changes in the fish community and better understand the impacts of increasing winter pool it appears the results of this project are unclear. However, based on research completed at other reservoirs and added recreational benefits to anglers and boaters the DFW recommends that the ACE maintain winter pool at 722 ft MSL.

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INTRODUCTION

Mississinewa Reservoir is a U.S. Army Corps of Engineers (ACE) flood control project located on the Mississinewa River in Grant, Miami, and Wabash counties. Since the dam's completion in 1967 a multitude of species have been stocked over the years with variable success (Table 1). Largemouth and smallmouth bass, bluegill, rock bass, channel catfish, redear sunfish, black crappie, walleye, and white bass were stocked shortly after the reservoir was completed. In the 1980's northern pike, tiger muskie, hybrid striped bass, and walleye were stocked with limited success. A walleye rearing pond was constructed on the property in 1991 to produce fingerlings to stock directly into the reservoir. Despite many years of stocking a good walleye fishery has never developed within the lake due to low survival, however a spring tailwater fishery has been documented (Braun 1998). Many of these fish are probably flushed downstream into the river or stranded in mud flats during fall drawdown.

During summer months surface acreage of the reservoir is maintained at approximately 3,180 acres. From October through December the water level of the reservoir is dropped 25 ft to facilitate spring flood storage, reducing the surface area of the reservoir to 1,280 acres. Winter pool is maintained through March, and summer pool is again attained by early April. In 1997 computer modeling indicated that a ten foot increase in winter pool in combination with a slower drawdown would not have a major impact on flood storage capacity, and the ACE agreed to a three year trial period to verify the model. The trial would increase winter pool from 712 to 722 ft MSL, and have the potential to improve the fish community. It's believed that current fluctuations including fall drawdown increases fish mortality by flushing fish downstream and stranding fish in coves and on mud flats (Smith and Anderson 1984). These fluctuations can also impact survival of young of the year and year class strength of certain species (Raibley et al. 1997, Sammons et al. 1999). Open water species like gizzard shad, white crappie, and white bass as well as bottom species like carp and channel catfish seem to tolerate these conditions more so than largemouth bass and bluegill.

Under the agreement the Division of Fish and Wildlife (DFW) was responsible for monitoring the fish population and reporting any changes resulting from the project. General fisheries surveys were completed from 1997 through 1999 until the project was halted in the fall of 1999. At that time the ACE announced there was a problem affecting the integrity of the dam. The reservoir was lowered to winter pool by October of that year and remained at that level until

the repairs were complete in the spring of 2005. Following the repairs to the dam the trial has continued and winter pool has remained 10 ft higher than normal. General fisheries surveys were completed again in 2006 and 2008. This report details the survey completed in 2008 and provides a summary of the project.

METHODS

The general survey of Mississinewa Reservoir was conducted from August 11 to August 13, 2008. A Garmin™ global positioning system device was used to record the location of fish collection sites. Equipment malfunction prevented the collection of water quality parameters.

Fish collection effort consisted of 4.0 h of pulsed D.C. night electrofishing with two dippers. Five trap nets and six experimental gill nets were set overnight on consecutive days. Total length of all fish was measured to the nearest 0.1 in and weight was measured to the nearest 0.01 lbs. Five scales per half-inch group were collected from bluegill, largemouth bass, white bass, and white crappie for age determination and back-calculated lengths-at-age. Length frequency distributions for reporting purposes were grouped in half-inch increments which are defined as X.0 – X.4 and X.5 – X.9. Age length keys were also constructed to determine mean lengths-at-age. Proportional stock density (PSD) was calculated for bluegill and largemouth bass using electrofishing catch only (Anderson and Neumann 1996).

RESULTS

A total of 2,368 fish, weighing 1144.54 lbs was collected during this survey. Bluegill was the most abundant species collected by number (22%), followed by gizzard shad (19%), and quillback (10%). Quillback was the most abundant species collected by weight (24%), followed by channel catfish (20%), and common carp (9%).

A total of 512 bluegills, ranging in total length from 1.5 to 7.2 in was collected. The electrofishing, gill net, and trap net catch rates were 88 fish/h, 1 fish/lift, and 16 fish/lift, respectively. The PSD for bluegill was 47. Bluegills of quality size (≥ 6 in) comprised 54% of the sample. Based on the age length key and back-calculated lengths-at-age the majority of bluegills reach 6 in by age 3.

Gizzard shad were also collected in large numbers totaling 457 fish, weighing 96.12 lbs. The electrofishing and gill net catch rates were 71 fish/h and 15 fish/lift, respectively. No shad were collected in trap nets.

Two hundred twenty-six white bass, weighing 97.97 lbs. were collected during the survey. The electrofishing and gill net catch rates were 5 fish/h and 17 fish/lift. No white bass were collected in trap nets. Total length of white bass collected ranged from 2.0 to 14.6 in. White bass of quality size (≥ 9 in) comprised 83% of the sample. Based on the age length key and back-calculated lengths-at-age the majority of white bass reach 9 in by age 2.

A total of 207 channel catfish, ranging in total length from 6.4 to 26.7 in was collected. The electrofishing and gill net catch rates were 2 fish/h and 16 fish/lift. No channel catfish were collected in trap nets. Channel catfish of quality size (≥ 16 in) comprised 46% of the sample.

White crappies were also collected during the survey totaling 139 fish, ranging in total length from 2.3 to 12.3 in. The electrofishing, gill net, and trap net catch rates were 2 fish/h, 7 fish/lift, and 6 fish/lift, respectively. White crappies of quality size (≥ 8 in) comprised 46% of the sample. Based on the age length key and back-calculated lengths-at-age the majority of white crappies reach 8 in by age 3.

One hundred fifteen largemouth bass were collected during the August survey, ranging in total length from 2.7 to 21.4 in. The electrofishing and gill net catch rates were 27 fish/h and 1 fish/lift. No bass were collected in trap nets. The PSD for largemouth bass was 45. Bass of legal size (≥ 14 in) comprised 7% of the sample. Based on the age length key and back-calculated lengths-at-age the majority of largemouth bass reach 14 in by age 4.

Other species worth noting include freshwater drum and black crappie. Drum ranged in length from 2.6 to 19 in and weighed 64.19 lbs. Forty-eight black crappies, ranging in total length from 5.8 to 9.9 in were collected.

DISCUSSION

The six year dam repair project that was completed in 2005 has severely confounded the results of the original research project to measure impacts on the fish community as a result of increasing winter pool at Mississinewa Reservoir. Catch rates for largemouth bass and bluegill increased in 2006 following the dam repair (Table 2). Increased recruitment of both species was likely due to a combination of stable water levels during construction and increased cover and nutrients once the water levels returned to summer pool. Excluding catch rates observed in 2006, catch rates of both bass and bluegill during 1999 and 2008 are slightly elevated when compared to previous surveys conducted prior to the change in water level management. However, these increases are minimal and could be the result of sampling variation.

Furthermore, much of the brush and tree species that became established during the dam repair could still be impacting the fish community further biasing the 2008 results.

Changes in abundance of other game species including white crappie, white bass, channel catfish, and walleye were minimal (Table 3). Gill net catch rates of white crappie, white bass, and channel catfish remained stable, while electrofishing catch rates of walleye remained low. In addition no changes in growth rates, age composition, or size structure were observed for any species. Growth remains similar to past surveys and the fish community continues to contain very few old individuals.

Although no dramatic increases have been documented as a result of this project a reduction in fish mortality and an increase in invertebrates as a result of increasing winter pools have been documented at other flood control reservoirs (Benson and Hudson 1975, Ramsey and Pierce 1978, Smith and Anderson 1984). In addition, greater abundance of bluegills and largemouth bass in other Indiana ACE reservoirs in which water levels are more stable when compared to Mississinewa have also been documented. Patoka and Monroe Reservoirs, although much larger, consistently have larger populations of both bass and bluegill. Catch rates of stock size largemouth bass and bluegill at Patoka from 2003 to 2009 averaged 91 and 551 fish/h, respectively. While the catch rate of stock size bluegill at Monroe in 2007 was 148 fish/h.

Despite our best efforts to measure changes in the fish community and better understand the impacts of increasing winter pool it appears the results of this project are unclear. The short amount of time allowed for this project combined with the dam repair drastically limited the ability to detect changes in the fish community. In addition extreme fluctuations in pool elevation documented during late winter and spring are often more severe than winter drawdown, which likely counteracts any benefits an increased winter pool may provide. However, based on research completed at other reservoirs and added recreational benefits to anglers and boaters the DFW recommends that the ACE maintain winter pool at 722 ft MSL. Furthermore the Wabash River Consortium has also been in contact with the ACE and is interested in modifying winter pool drawdown at all three upper Wabash reservoirs. Although the details of any such project have not been finalized it would likely include increasing winter pool to reflect more natural river conditions potentially improving fish and mussel habitat in the Wabash.

RECOMMENDATIONS

- The DFW recommends that the ACE continue to use 722 ft MSL as the recognized winter pool level.

- The rearing pond at Mississinewa Reservoir should continue to receive walleye fry on an annual basis when fish are available.

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Table 1. Year, species, size, and number of fish stocked into Mississinewa Reservoir from 1967 through 2008.

Year	Species	Size (in)	Number
1967	Largemouth bass	8-10	2,577
1967	Smallmouth bass	2-7	28,668
1967	Rock bass	1-3	3,610
1967	Channel catfish	4-12	15,000
1967	Black crappie	1	35,000
1967	Northern pike	18-25	1,100
1968	Bluegill	1-2	26,300
1968	Redear sunfish	1-2	17,200
1970	Walleye	fry	1,000,000
1971	Walleye	fry	750,000
1972	White bass	adult	328
1982	Northern pike	2-3	17,688
1983*	Walleye	2-3	58,000
1985*	Walleye	2-3	77,950
1985	Tiger muskie	6-8	10,000
1986	Hybrid striped bass	1-2	23,970
1987	Walleye	1-2	Unknown
1988	Walleye	1-2	229,000
1989	Walleye	1-2	150,312
1990	Walleye	1-2	245,316
1990	Walleye	1-2	67,650
1991	Walleye	1-2	86,865
1992-1998**	Walleye	2-5	Unknown
2005-2008**	Walleye	2-5	Unknown

* Purchased from private source.

**Reared in the property pond and released directly to reservoir.

Table 2. Year collected, electrofishing catch rate (All), electrofishing catch rate of stock size (Stock), and back-calculated length-at-age 3 for bluegill and largemouth bass collected at Mississinewa Reservoir from 1987 through 2008.

Bluegill				
Year	All	Stock	Size	Age 3
1987	66	54	1.8 - 7.6	NA
1997	28	27	1.2 - 7.7	5.8
1998	59	54	1.0 - 7.8	6.0
1999	93	91	1.0 - 7.6	6.5
2006	291	227	1.0 - 8.5	7.0
2008	88	87	1.5 - 7.2	6.1
Largemouth bass				
1987	112	20	2.6 - 14.8	12.3
1997	21	11	1.8 - 17.0	11.6
1998	52	13	3.0 - 16.4	12.8
1999	41	12	2.5 - 18.9	11.2
2006	121	60	2.3 - 19.1	12.7
2008	27	22	2.7 - 21.4	11.1

Table 3. Gill net catch rates of channel catfish, white bass, and white crappie at Mississinewa Reservoir from 1987 through 2008.

Species	1987	1997	1998	1999	2006	2008
Channel catfish	24	35	27	36	25	16
White bass	12	5	8	13	7	17
White crappie	29	10	9	17	5	7

APPENDIX

Lake Pages

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [x] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Mississinewa Reservoir	Miami, Wabash, Grant	8/11/2008
Biologist's name		Date of survey (Month, day, year)
Rod A Edgell		8/13/2008

LOCATION		
Quadrangle Name: Peoria, Somerset	Range:	Section:
Township Name:	Nearest Town: Peoria	

ACCESSIBILITY					
State owned public access site: 4 improved boat ramps, 5 unimproved launch sites			Privately owned public access site:		Other access site:
Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
3,180	77 ft	24 ft	75,200	737 ft MSL	67 ft
Location of benchmark: 200 feet west of dam					

INLETS		
Name	Location	Origin
See attached		

OUTLETS	
Name: Mississinewa River	Location: T26N R5E S10
Water level control: Two 30 inch bypass tubes, four control gates.	

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM	797	
TOP OF FLOOD CONTROL POOL	779	12,830
TOP OF CONSERVATION POOL	737	3,180
TOP OF MINIMUM POOL	722	1,840
STREAMBED	660	

Bottom type:
- [x] Bolder
- [x] Gravel
- [x] Sand
- [x] Muck
- [x] Clay
- [ ] Marl

Watershed use: Agriculture, municipal, and residential.

Development of shoreline: State operated public recreation area.

Previous surveys and investigations

General Fisheries surveys; 1968, 1969, 1970, 1972-1974, 1976, 1979, 1983, 1987, 1988, 1997, 1998, and 2006.

Embayment sampling; 1968 and 1969. Walleye sampling; 1983-1985, 1988, 1991-1993, 1995, and 2005.

Inlets of Mississinewa Reservoir

Name	Location	Origin
Mississinewa River	T26N, R7E, S32	T13N, R15E, S8
Metocinah Creek	T26N, R7E, S32	T25N, R8E, S11
Grant Creek	T26N, R7E, S30	T26N, R7E, S29
Forked Creek	T26N, R6E, S23	T26N, R6E, S9
Muddy Branch	T26N, R6E, S23	T26N, R7E, S13
Goose Creek	T26N, R6E, S29	T26N, R6E, S21
Liston Creek	T26N, R6E, S24	T26N, R5E, S35
Rock Run	T26N, R6E, S32	T25N, R6E, S4
Tenmile Creek	T26N, R6E, S33	T25N, R6E, S3
Cart Creek	T26N, R7E, S3	T25N, R7E, S33

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night Hours		Total Hours
			4		4
TRAP NETS	Number of Traps		Number of Lifts		Total Lifts
	5		2		10
GILL NETS	Number of Nets		Number of Lifts		Total Lifts
	6		2		12
ROTENONE	Gallons	ppm	Acre-feet Treated	SHORELINE SEINING	Number of 100 ft Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS							
Color	Turbidity (Secchi Disk)				Air Temperature	70	F
Brown-Green	4	Feet	0	Inches	Water temperature	80	F

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT						
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches) minimum	LENGTH RANGE (inches) maximum	WEIGHT (pounds)	PERCENT
Bluegill	512	21.6	1.5	7.2	71.75	6.3
Gizzard shad	457	19.3	2.6	11.8	96.12	8.4
Quillback	233	9.8	9.4	17.2	278.90	24.4
White bass	226	9.5	2	14.6	97.97	8.6
Channel catfish	207	8.7	6.4	26.7	227.12	19.8
Freshwater drum	200	8.4	2.6	19	64.19	5.6
White crappie	139	5.9	2.3	12.3	29.07	2.5
Largemouth bass	115	4.9	2.7	21.4	86.45	7.6
Common carp	76	3.2	11	26	104.69	9.1
Longear sunfish	50	2.1	3.3	5.6	4.38	0.4
Black crappie	48	2.0	5.8	9.9	14.34	1.3
Green sunfish	21	0.9	3.2	6.4	1.77	0.2
Log perch	13	0.5	3.1	5.2	0.23	0.0
Smallmouth bass	13	0.5	5.7	12.3	3.43	0.3
Walleye	12	0.5	5.6	12.5	2.50	0.2
Flathead catfish	8	0.3	10.8	15.5	6.09	0.5
Brook silverside	6	0.3	2.4	3.7	0.02	0.0
Golden redhorse	6	0.3	17.4	20.9	18.37	1.6
Spotfin shiner	6	0.3	3	3.7	0.06	0.0
Orangespotted sunfish	5	0.2	2.6	2.7	0.05	0.0
Smallmouth buffalo	5	0.2	14.4	22.8	19.97	1.7
Bigmouth buffalo	3	0.1	18.7	22.1	12.43	1.1
Spotted sucker	2	0.1	7.2	13.8	1.17	0.1
Northern hog sucker	1	0.0	7.6	7.6	0.17	0.0
Redear sunfish	1	0.0	4	4	0.05	0.0
River redhorse	1	0.0	20.5	20.5	3.20	0.3
Warmouth	1	0.0	3.9	3.9	0.05	0.0
Yellow bullhead	1	0.0	10.3	10.3	0.00	0.0
Total (28)	2368	100.0			1144.54	100.0

*Common names of fishes recognized by the American Fisheries Society.

Abundance of fish collected during general surveys at Mississinewa Reservoir from 1979 through 2008.

Species	1979	1983	1987	1997	1998	1999	2006	2008
Bluegill	8	27	131	184	179	377	1328	512
Gizzard shad	59	1172	240	200	622	692	1052	457
Quillback	89	30	105	535	244	280	317	233
White bass	118	69	191	269	328	316	99	226
Channel Catfish	114	187	409	784	416	589	309	207
Freshwater drum				25	58	67	62	200
White crappie	432	337	359	328	153	295	98	139
Largemouth bass	40	54	223	127	161	165	506	115
Common carp	855	298	186	278	156	208	162	76
Longear sunfish	201	44	199	131	14	75	117	50
Black crappie		16	8	40	20	55	117	48
Green sunfish	45	16	42	10	7	10	167	21
Log perch	present	present	73	107	43	33	57	13
Smallmouth bass	20	9	117	86	38	32	15	13
Walleye			3	56	127	69	4	12
Flathead catfish	3	5	22	17	14	22	6	8
Brook silverside	present	present		15			8	6
Golden redhorse				23	3	9	1	6
Spotfin shiner	1			29		1		6
Orangespotted sunfish	1	3	6	35	21	1	5	5
Smallmouth buffalo							3	5
Bigmouth buffalo								3
Spotted sucker				68	9	15		2
Redear sunfish			1	1			3	1
Yellow bullhead		1		1			2	1
Warmouth								1
Northern hogsucker	4			1				1
River redhorse								1
Black bullhead	1			1			7	
Bluntnose minnow							3	
Hybrid sunfish			2	2		1	2	
Longnose gar	4			9	9		1	
Rainbow darter							1	
Yellow perch	5	17	20	67	14	24		
Highfin carpsucker						3		
White sucker	1					2		
Slenderhead darter					3	2		
Northern pike		2						
Greenside darter		present	4					
Hybrid striped bass			28					
Goldfish			2					
Tiger muskie			1					
Silver redhorse					2			
Total	2001	2287	2372	3429	2641	3343	4452	2368
Electrofishing Effort (h)	6.0	3.4	2.0	6.0	3.0	4.0	4.0	4.0
# of Gill Net Lifts	6	12	12	12	15	16	11	12
# of Trap Net Lifts	0	0	0	12	0	0	9	10

					TN	GN	EF
Lake:	Mississinewa Reservoir			Total #	148	12	352
Date:	8/11/2008	to	8/13/2008	Effort	9	12	4
Species:	Bluegill			CPUE	16	1	88
Total number:	512						
Total weight:	71.75						
Length range:	1.5	to	7.2				

Group	TL (in)	TN	GN	EF	TOTAL	RSD
Stock	3	145	12	346	503	-
Quality	6	104	7	163	274	47
Preferred	8	0	0	0	0	
Memorable	10	0	0	0	0	
Trophy	12	0	0	0	0	

Length group (in)	TN	GN	EF	Total	Mean weight (lbs)	Length group (in)	TN	GN	EF	Total	Mean weight (lbs)
1.0						17.5					
1.5	1		1	2	0.00	18.0					
2.0	2		5	7	0.01	18.5					
2.5						19.0					
3.0						19.5					
3.5			4	4	0.04	20.0					
4.0	1	1	22	24	0.06	20.5					
4.5	10		45	55	0.08	21.0					
5.0	6		49	55	0.10	21.5					
5.5	24	4	63	91	0.13	22.0					
6.0	64	1	88	153	0.16	22.5					
6.5	35	5	67	107	0.20	23.0					
7.0	5	1	8	14	0.24	23.5					
7.5						24.0					
8.0						24.5					
8.5						25.0					
9.0						25.5					
9.5						26.0					
10.0						26.5					
10.5						27.0					
11.0						27.5					
11.5						28.0					
12.0						28.5					
12.5						29.0					
13.0						29.5					
13.5						30.0					
14.0						30.5					
14.5						31.0					
15.0						31.5					
15.5						32.0					
16.0						32.5					
16.5						33.0					
17.0						33.5					

					TN	GN	EF
Lake:	Mississinewa Reservoir						
Date:	8/11/2008	to	8/13/2008	Total #	1	207	18
Species:	White bass			Effort	9	12	4
Total number:	226			CPUE	0	17	5
Total weight:	97.97						
Length range:	2.0	to	14.6				

Group	TL (in)	TN	GN	EF	TOTAL	RSD
Stock	6	1	207	8	216	-
Quality	9	1	181	5	187	63
Preferred	12	1	22	0	23	
Memorable	15	0	0	0	0	
Trophy	18	0	0	0	0	

Length group (in)	TN	GN	EF	Total	Mean weight (lbs)	Length group (in)	TN	GN	EF	Total	Mean weight (lbs)
1.0						17.5					
1.5						18.0					
2.0			2	2	0.01	18.5					
2.5			2	2	0.02	19.0					
3.0			2	2	0.02	19.5					
3.5			1	1	0.03	20.0					
4.0			1	1	0.04	20.5					
4.5			1	1	0.05	21.0					
5.0			1	1	0.06	21.5					
5.5						22.0					
6.0						22.5					
6.5						23.0					
7.0						23.5					
7.5		1		1	0.25	24.0					
8.0		3	1	4	0.26	24.5					
8.5		22	2	24	0.31	25.0					
9.0		76	2	78	0.36	25.5					
9.5		67	3	70	0.43	26.0					
10.0		9		9	0.33	26.5					
10.5						27.0					
11.0		5		5	0.68	27.5					
11.5		2		2	0.73	28.0					
12.0		1		1	0.00	28.5					
12.5		2		2	0.95	29.0					
13.0		8		8	0.89	29.5					
13.5	1	8		9	1.08	30.0					
14.0		1		1	1.25	30.5					
14.5		2		2	1.43	31.0					
15.0						31.5					
15.5						32.0					
16.0						32.5					
16.5						33.0					
17.0						33.5					

Lake:	Mississinewa Reservoir				**TN**	**GN**	**EF**
Date:	8/11/2008	to	8/13/2008	Total #	2	197	8
Species:	Channel catfish			Effort	9	12	4
Total number:	207			CPUE	0	16	2
Total weight:	227.12						
Length range:	6.4	to	26.7				

Group	**TL (in)**	**TN**	**GN**	**EF**	**TOTAL**	**RSD**
Stock	11	2	155	6	163	-
Quality	16	2	89	5	96	83
Preferred	24	1	8	0	9	
Memorable	28	0	0	0	0	
Trophy	36	0	0	0	0	

Length group (in)	TN	GN	EF	Total	Mean weight (lbs)	Length group (in)	TN	GN	EF	Total	Mean weight (lbs)
1.0						17.5	1	2	1	4	1.51
1.5						18.0		5		5	0.73
2.0						18.5		4		4	1.87
2.5						19.0		7		7	1.17
3.0						19.5		6	1	7	1.74
3.5						20.0		4		4	1.11
4.0						20.5		5		5	0.48
4.5						21.0		9	1	10	2.27
5.0						21.5		3		3	1.07
5.5						22.0		4		4	1.84
6.0		1		1	0.08	22.5		2		2	2.00
6.5		2		2	0.10	23.0		5		5	3.20
7.0		3		3	0.09	23.5		6	1	7	4.62
7.5						24.0	1	4		5	4.34
8.0			1	1	0.15	24.5		1		1	5.30
8.5		3		3	0.22	25.0		1		1	0.00
9.0		8		8	0.21	25.5		1		1	5.36
9.5		13		13	0.24	26.0					
10.0		9	1	10	0.23	26.5		1		1	0.00
10.5		3		3	0.33	27.0					
11.0		4		4	0.38	27.5					
11.5		10		10	0.42	28.0					
12.0		17		17	0.49	28.5					
12.5		5		5	0.52	29.0					
13.0		5		5	0.34	29.5					
13.5		4		4	0.57	30.0					
14.0		9		9	0.45	30.5					
14.5		4		4	0.62	31.0					
15.0		3	1	4	0.95	31.5					
15.5		5		5	1.01	32.0					
16.0		8		8	0.91	32.5					
16.5		9		9	0.98	33.0					
17.0		2	1	3	1.09	33.5					

					TN	GN	EF
Lake:	Mississinewa Reservoir			Total #	51	82	6
Date:	8/11/2008	to	8/13/2008	Effort	9	12	4
Species:	White crappie			CPUE	6	7	2
Total number:	139						
Total weight:	29.07						
Length range:	2.3	to	12.3				

Group	TL (in)	TN	GN	EF	TOTAL	RSD
Stock	5	49	82	5	136	-
Quality	8	30	29	5	64	100
Preferred	10	8	5	1	14	20
Memorable	12	1	0	1	2	20
Trophy	15	0	0	0	0	

Length group (in)	TN	GN	EF	Total	Mean weight (lbs)	Length group (in)	TN	GN	EF	Total	Mean weight (lbs)
1.0						17.5					
1.5						18.0					
2.0	2			2	0.00	18.5					
2.5			1	1	0.00	19.0					
3.0						19.5					
3.5						20.0					
4.0						20.5					
4.5						21.0					
5.0						21.5					
5.5		3		3	0.06	22.0					
6.0	1	13		14	0.11	22.5					
6.5	8	19		27	0.13	23.0					
7.0	6	11		17	0.15	23.5					
7.5	4	7		11	0.20	24.0					
8.0	6	10		16	0.25	24.5					
8.5	5	5	3	13	0.22	25.0					
9.0	7	5		12	0.34	25.5					
9.5	4	4	1	9	0.43	26.0					
10.0	6	2		8	0.36	26.5					
10.5		2		2	0.00	27.0					
11.0		1		1	0.00	27.5					
11.5	1			1	0.76	28.0					
12.0	1		1	2	0.40	28.5					
12.5						29.0					
13.0						29.5					
13.5						30.0					
14.0						30.5					
14.5						31.0					
15.0						31.5					
15.5						32.0					
16.0						32.5					
16.5						33.0					
17.0						33.5					

					TN	GN	EF
Lake:	Mississinewa			Total #	2	7	106
Date:	8/11/2008	to	8/13/2008	Effort	9	12	4
Species:	Largemouth bass			CPUE	0	1	27
Total number:	115						
Total weight:	86.45						
Length range:	2.7	to	21.4				

Group	TL (in)	TN	GN	EF	TOTAL	RSD
Stock	8	0	7	89	96	-
Quality	12	0	4	40	44	45
Preferred	15	0	0	6	6	7
Memorable	20	0	0	1	1	1
Trophy	25	0	0	0	0	

Length group (in)	TN	GN	EF	Total	Mean weight (lbs)	Length group (in)	TN	GN	EF	Total	Mean weight (lbs)
1.0						17.5			1	1	2.99
1.5						18.0					
2.0						18.5					
2.5			1	1	0.01	19.0					
3.0			1	1	0.02	19.5					
3.5	2			2	0.00	20.0					
4.0			1	1	0.03	20.5					
4.5			2	2	0.03	21.0			1	1	6.08
5.0			3	3	0.07	21.5					
5.5						22.0					
6.0						22.5					
6.5						23.0					
7.0			4	4	0.20	23.5					
7.5			5	5	0.22	24.0					
8.0			2	2	0.31	24.5					
8.5			3	3	0.32	25.0					
9.0			2	2	0.36	25.5					
9.5			1	1	0.46	26.0					
10.0		1	2	3	0.37	26.5					
10.5			11	11	0.58	27.0					
11.0		2	7	9	0.58	27.5					
11.5			21	21	0.74	28.0					
12.0		1	19	20	0.80	28.5					
12.5		3	7	10	0.97	29.0					
13.0			5	5	1.08	29.5					
13.5			1	1	1.44	30.0					
14.0			1	1	1.27	30.5					
14.5			1	1	1.40	31.0					
15.0						31.5					
15.5			3	3	2.06	32.0					
16.0						32.5					
16.5						33.0					
17.0			1	1	2.66	33.5					

Back-calculated lengths-at-age for bluegill captured at Mississinewa Reservoir in August 2008.

		Age			
Year Class	# Aged	1	2	3	4
2007	13	2.5			
	SD	0.5			
2006	12	2.5	4.2		
	SD	0.7	1.0		
2005	11	3.0	5.1	6.1	
	SD	0.4	1.0	0.8	
2004	1	2.9	4.1	5.0	6.0
	SD				
Mean*		2.7	4.7	6.1	
SD		0.5	1.0	0.8	

*Does not include age groups with less than three samples.

Age-length key for bluegill captured at Mississinewa Reservoir in August 2008.

Length	# in	# (age) in	Age			
Group	sample	subsample	1	2	3	4
1.0						
1.5	2	1(0)				
2.0	7	5(0)				
2.5						
3.0						
3.5	4	1(0), 2(1)	3			
4.0	24	4(1), 1(2)	19	5		
4.5	55	4(1), 1(2)	44	11		
5.0	55	3(1), 2(2)	33	22		
5.5	91	3(2), 2(3)		55	36	
6.0	153	5(2)		153		
6.5	107	4(3), 1(4)			86	21
7.0	14	5(3)			14	
Mean TL			4.8	5.9	6.5	6.8
SE			0.04	0.03	0.04	

Back-calculated lengths-at-age for white bass captured at Mississinewa Reservoir in August 2008.

		Age		
Year Class	# Aged	1	2	3
2007	16	5.0		
	SD	1.8		
2006	20	4.0	7.5	
	SD	1.5	2.3	
2005	14	8.0	10.5	12.7
	SD	2.0	0.8	0.9
Mean*		5.7	9.0	12.7
SD		1.7	1.6	0.9

*Does not include age groups with less than three samples.

Age-length key for white bass captured at Mississinewa Reservoir in August 2008.

Length Group	# in sample	# (age) in subsample	Age		
			1	2	3
2.0	2				
2.5	2	2(0)			
3.0	2	2(0)			
3.5	1	1(0)			
4.0	1				
4.5	1	1(1)	1		
5.0	1	1(1)	1		
5.5					
6.0					
6.5					
7.0					
7.5	1	1(2)		1	
8.0	4	2(1), 2(2)	2	2	
8.5	24	3(1), 2(2)	14	10	
9.0	78	4(1), 1(2)	62	16	
9.5	70	3(1), 2(2)	42	28	
10.0	9	5(2)		9	
10.5					
11.0	5	2(1), 3(2)	2	3	
11.5	2	2(2)		2	
12.0	1	1(3)			1
12.5	2	2(3)			2
13.0	8	1(2), 4(3)		2	6
13.5	9	1(2), 4(3)		2	7
14.0	1	1(3)			1
14.5	2	2(3)			2
Mean TL			9.3	9.8	13.5
SE			0.1	0.1	0.1

Back-calculated lengths-at-age for white crappie captured at Mississinewa Reservoir in August 2008.

		Age			
Year Class	# Aged	1	2	3	4
2007	15	3.7			
	SD	0.3			
2006	15	3.5	6.4		
	SD	0.7	1.3		
2005	17	3.2	6.1	7.9	
	SD	0.5	1.2	1.7	
2004	2	3.8	8.6	10.3	11.0
	SD	0.3	0.1	1.0	1.5
Mean*		3.5	6.3	7.9	
SD		0.5	1.2	1.7	

*Does not include age groups with less than three samples.

Age-length key for white crappie captured at Mississinewa Reservoir in August 2008.

Length Group	# in sample	# (age) in subsample	Age			
			1	2	3	4
1.0						
1.5						
2.0	2					
2.5	1	1(0)				
3.0						
3.5						
4.0						
4.5						
5.0						
5.5	3	2(1), 1(2)	2	1		
6.0	14	3(1), 1(2)	11	3		
6.5	27	5(1)	27			
7.0	17	5(1)	17			
7.5	11	3(2), 2(3)		7	4	
8.0	16	4(2), 1(3)		13	3	
8.5	13	2(2), 2(3)		6	7	
9.0	12	1(2), 4(3)		2	10	
9.5	9	2(2), 3(3)		4	5	
10.0	8	1(2), 3(3), 1(4)		2	4	2
10.5	2	1(3)			2	
11.0	1	1(3)			1	
11.5	1	1(3)			1	
12.0	2	1(4)				2
Mean TL			6.8	8.3	9.3	11.4
SE			0.1	0.2	0.2	0.6

Back-calculated lengths-at-age for largemouth bass captured at Mississinewa Reservoir in August 2008.

		Age								
Year Class	# Aged	1	2	3	4	5	6	7	8	9
2007	8	4.6								
	SD	0.6								
2006	9	4.6	8.2							
	SD	1.3	1.6							
2005	22	5.6	8.8	11.1						
	SD	2.1	1.5	1.4						
2004	8	4.6	8.5	11.1	13.4					
	SD	0.8	1.5	2.4	2.1					
2003	2	5.1	7.8	11.1	12.4	13.9				
	SD	0.4	1.3	1.6	2.0	1.8				
2002	0									
	SD									
2001	0									
	SD									
2000	0									
	SD									
1999	1	6.4	10.5	12.8	14.6	16.2	17.7	18.7	19.8	21.0
	SD									
Mean*		4.9	8.5	11.1	13.4					
SD		1.2	1.5	1.9	2.1					

*Does not include age groups with less than three samples.

Age-length key for largemouth bass captured at Mississinewa Reservoir in August 2008.

Length	# in	# (age) in	Age								
Group	sample	subsample	1	2	3	4	5	6	7	8	9
2.5	1	1(0)									
3.0	1	1(0)									
3.5	2	2(0)									
4.0	1	1(0)									
4.5	2	2(0)									
5.0	3	3(0)									
5.5											
6.0											
6.5											
7.0	4	3(1)	4								
7.5	5	3(1), 1(2)	4	1							
8.0	2	1(1)	2								
8.5	3	1(1), 1(2)	1	2							
9.0	2	1(2)		2							
9.5	1										
10.0	3	2(2), 1(3)		2	1						
10.5	11	2(2), 3(3)		4	7						
11.0	9	1(2), 3(3), 1(4)		2	5	2					
11.5	21	5(3)			21						
12.0	20	1(2), 4(3)		4	16						
12.5	10	3(3), 2(4)			6	4					
13.0	5	2(3), 2(4), 1(5)			2	2	1				
13.5	1										
14.0	1	1(3)			1						
14.5	1										
15.0											
15.5	3	2(4), 1(5)				2	1				
16.0											
16.5											
17.0	1	1(4)				1					
17.5	1										
18.0											
18.5											
19.0											
19.5											
20.0											
20.5											
21.0	1	1(9)									1
Mean TL			7.8	10.5	11.9	13.6	14.5				21.3
SE			0.2	0.3	0.1	0.6	1.3				

Sampling gear locations at Mississinewa Reservoir in 2008.

Gill Nets				
1	N	40.709131	W	-85.960711
2	N	40.717354	W	-85.951442
3	N	40.714259	W	-85.941904
4	N	40.701320	W	-85.932795
5	N	40.699732	W	-85.929539
6	N	40.688633	W	-85.914019
7	N	40.673822	W	-85.878432
8	N	40.661677	W	-85.856325
9	N	40.674182	W	-85.833446
10	N	40.687040	W	-85.890020
11	N	40.681030	W	-85.879650
12	N	40.693470	W	-85.908470

Trap Nets				
1	N	40.707575	W	-85.960277
2	N	40.707795	W	-85.939318
3	N	40.706245	W	-85.922130
4	N	40.686429	W	-85.887181
5	N	40.673232	W	-85.879612
6	N	40.675657	W	-85.868942
7	N	40.678859	W	-85.816527
8	N	40.685520	W	-85.887700
9	N	40.678330	W	-85.886270

Electrofishing Transects				
1	N	40.693756	W	-85.914159
	N	40.693949	W	-85.906010
2	N	40.687008	W	-85.911691
	N	40.684680	W	-85.904798
3	N	40.680914	W	-85.894364
	N	40.678554	W	-85.886505
4	N	40.682148	W	-85.888120
	N	40.681075	W	-85.879907
5	N	40.681139	W	-85.878856
	N	40.681171	W	-85.871034
6	N	40.705400	W	-85.956900
	N	40.708700	W	-85.961600
7	N	40.717100	W	-85.949500
	N	40.715900	W	-85.945900
8	N	40.714500	W	-85.938900
	N	40.713700	W	-85.934000
9	N	40.712000	W	-85.929400
	N	40.710700	W	-85.924800
10	N	40.698200	W	-85.927500
	N	40.694400	W	-85.928200